

Date: Wednesday, 13/05/2009 10:07:36 AM
 User: Chantal Lavoie

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : ROUND BILLET 17-4
Job Number : 47934	
Estimate Number : 10041	
P.O. Number :	Part Number : D6104007
This Issue : 13/05/2009 S.O. No. :	Drawing Number : D6104 REV B
Prsht Rev. : NC	Project Number : N/A
First Issue : / / Type : PURCHASED PARTS	Drawing Revision : B
Previous Run : 45659	Material :
Written By :	Due Date : 28/05/2009 Qty: 20 Um: Each
Checked & Approved By : <u>C809/05/13</u>	
Comment : Est. A: 01.05.08 New Issue EC	

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	PG	PURCHASING
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**Comment:** PURCHASINGIssue P/O: 8801C809/05/13

a) Description: S.S round billet

b) Ø4.50" x 5.10" long

c) Tolerance on all dimensions are +0.030"/-0.000"

d) Material: 17-4PH Stainless steel (Ams 5643 or Aisi 630)

e) One blank makes 2 parts

f) Material certification required

(20)

2.0	D6104007P	17-4 SS Roundbar 4.50"OD
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 20.0000 Each(s)
 17-4 SS Roundbar 4.50"OD

3.0	PACKAGING 1	PACKAGING RESOURCE #1
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**Comment:** PACKAGING RESOURCE #1

Receive & Inspect For Transit Damage

Ensure material certification is attached

P0 9/6/12 (20)

4.0	QC6	DIMENSIONAL CHECK
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**Comment:** DIMENSIONAL CHECK

Ensure Material certification comply to Dwg D6104

> 09/06/02 (20)

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Wednesday, 13/05/2009 10:07:36 AM
User: Chantal Lavoie

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: ROUND BILLET 17-4

Job Number: 47934

Part Number: D6104007

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: _____

Machining MF 09-06-03

6.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

09/06/04 *JA*

Job Completion



MF
09-06-03

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

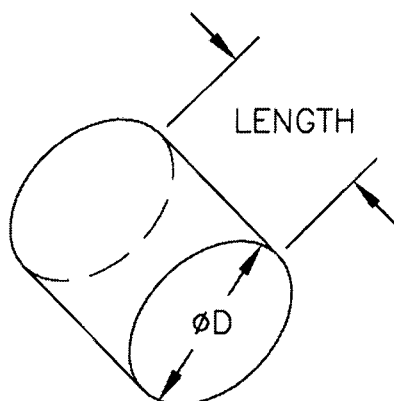
NOTE: Date & initial all entries



DESIGN TJ	DRAWN BY 	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED 	APPROVED 	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4	SCALE NTS
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED
22.11.29

SPECIFICATION CONTROL DRAWING



W/O: 47934
CL 09/05/13

MATERIAL: 17-4 PH SS (AMS 5643 OR AISI 630) MIN UTS = 170 KSI (38 HRC)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
D6104-005	17-4 PH STAINLESS STEEL	Ø4.00	5.10
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

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**Castle Metals®**

A. M. Castle & Co.

BORDEREAU DE MARCHANDISES

Page 1 of 1

No de Formulaire d'Emballage / Pack Slip No:2751882

Expédié de / Ship From: Castle Metals MONTREAL 835-SELKIRK AVENUE POINTE CLAIRE, QUEBEC H9R 3S2		Vendu à / Sold To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7		Expédié à / Ship To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7		Livré à / Deliver To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA	
Date d'expédition / Date Shipped	F.O.B.	Modalités de transport / Freight Terms		Transporteur / Carrier	N° du Bon de connaissance / BOL No	N° de livraison / Delivery No	
02-JUN-09	ORIGIN	Prepaid		MANITOULIN	9306-2	2751882	

Détails d'expédition / Shipment Details	Destination finale / Final Destination Branch - MON
--	--

N° de commande / Order No	N° de ligne / Line No	N° d'article / Item No	Description			
197330	1	14998.MO	4.5000.RD.17CR-4NI.STAINLESS.RT.SOL TR.COND A.132.0000-156.0000 CUT TO 5.1 IN ()			
N° de bon de commande / Purchase Order No	Nbre de pièces / Part Number		Qté commandée / Ordered Qty	Qté Facturée / Invoice Qty	Solde à livrer / Backorder Qty	
8801			9 PCS	9 PCS		
Détails / Details						
Usine / Mill	No de coulée / Heat Number	Code mec / Mech Id	Pièces / PCS	Largeur (Pouce) / Width (IN)	Longueur (Pouce) / Length (IN)	Qté expédiée / Shipped Qty (LBS)
	A10086		9			212.78

Ces marchandises/technologies sont sujettes aux règlements de l'Export Administration et du département d'état des États-Unis. Si elles ont été/sont exportées, elles doivent se conformer à ces règlements. Toute modification du contrat de transport contraire aux lois des États-Unis est interdite.

These commodities/technologies are subject to US Export Administration & US State Dept. Regulations and, if intended for export, were/are exported thereunder. Diversion contrary to US Law is Prohibited.

Nous certifions par la présente que le matériel couvert par cette certification est conforme aux spécifications susmentionnées et aux exigences applicables pour le matériel, y compris toute spécification faisant partie de la description. Les rapports d'essai sont archivés pour fins de consultation. Toute requête concernant du matériel défectueux sera rejetée à moins qu'elle ne soit faite par écrit à A. M. Castle & Co. dans les 60 jours suivant la livraison. Le matériel coupé sur mesure ou coupé par le client ne peut être retourné pour crédit.

We hereby certify the material covered by this certification conforms in accordance with the above specifications and has been found to meet the applicable requirements for the material, including any specifications forming a part of the description. Test reports are on file subject to examination. All claims for defective material are waived unless made in writing to A.M. Castle & Co. within 60 days of the shipment. Material cut to the correct size, or material cut by the customer cannot be returned for credit.

Ce matériel a été reçu et inspecté par

This material has been received and inspected by:

Date:



PO BOX 877
SYRACUSE, NY 13201-0877

Certificate of Test

S O L D A M CASTLE, INC 3400 N WOLF RD FRANKLIN PARK, IL 60131		S H I P T O A M CASTLE, INC 3400 N WOLF RD FRANKLIN PARK, IL 60131		OUR ORDER NO. P5-11179-8-0' DATE 10/09/08
CUSTOMER ORDER NO 01-45084	CUSTOMER REQ NO	DISTRICT B PARSONS	SHIPPED FROM SYRACUSE	

DESCRIPTION OF MATERIAL

CRU 17-4PH RT A IAC 14998
 AMC-3174-02 REV 28 ASME-SA564-07ED T630 ASTM-A564-04 T630
 AMS-2303E AMS-5643R (EX SURF) AISI-630 UNS-S17400
 DFARS 252.225-7014 ALT 1

SIZE

4.500 RD

HEAT NO.

CHEMICAL ANALYSIS

A10086	C	MN	P	S	SI	NI	CR	MO	CU	CB	TA
	.042	.51	.023	.018	.60	4.47	15.31	.24	3.21	.28	.005

QUANTITY HEAT NO.

MECHANICAL PROPERTIES

5412 # A10086 TENSILE PSI YLD.2%PSI %ELONG4D RED/AREA% HARDNESS
 BHN 334

CAPABILITY PHYSICALS AFTER 900 DEG. F. - 1 HR. AIRCOOL:
 201,550 174,450 13.8 51.9 BHN 401

MACRO TEST OK

MICRO TEST OK

FERRITE 5 ±

MAGNAFLUX F/S = 0/0

ELECTRIC FURNACE AOD MELTED

REDUCTION RATIO: 14.8:1

MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 2 HOURS

AT TEMPERATURE -

AIRCOOLED.

CRUCIBLE MATERIALS CORP. VENDOR #18610.

MATERIAL INGOT CAST.

NAFTA - YES

CASTLE METALS CORP.
 DATE RCVD 10/13/08
 IAC 14998
 APPROVED BY [Signature]

MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT, NO WELD REPAIR PERFORMED, AND MATERIAL MELTED IN U.S.A.

THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED ACCORDANCE WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE WITH THE SPECIFICATION REQUIREMENTS.
 CRUCIBLE MATERIALS CORPORATION ACTING BY AND THROUGH ITS SPECIALTY METALS DIVISION

CERTIFIED BY

[Signature]

DANA A. CUSANO - QUALITY ASSURANCE REPRESENTATIVE

**Castle Metals®**

A. M. Castle & Co.

BORDEREAU DE MARCHANDISES

Page 1 of 1

No de Formulaire d'Emballage / Pack Slip No: 40043

Expédié de / Ship From:		Vendu à / Sold To:		Expédié à / Ship To:		Livré à / Deliver To:	
Castle Metals Montreal 835-Selkirk Avenue Pointe Claire, QUEBEC H9R 3S2		DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7		DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7			
Date d'expédition / Date Shipped	F.O.B.	Modalités de transport / Freight Terms		Transporteur / Carrier		N° du Bon de connaissance / BOL No	N° de livraison / Delivery No
01-JUN-09	ORIGIN	Prepaid				38746	2804856

Détails d'expédition / Shipment Details			Destination finale / Final Destination Branch -			
N° de commande / Order No	N° de ligne Line No	N° d'article / Item No	Description			
198936	1	14998.MO	4.5000.RD.17CR-4NI.STAINLESS.RT.SOL TR.COND A.132.0000-156.0000 CUT TO 5.1 IN ()			
N° de bon de commande / Purchase Order No		N° de pièces / Part Number	Qté commandée / Ordered Qty	Qté Facturée / Invoice Qty	Solde à livrer / Backorder Qty	
8801			11 PCS	11 PCS		
Détails / Details						
Usine / Mill	No de coulee / Heat Number	Code mec / Mech Id	Pièces / PCS	Largeur (Pouce) / Width (IN)	Longueur (Pouce) / Length (IN)	Qté expédiée / Shipped Qty (LBS)
	A10357		11			280.07

<p>Ces marchandises/technologies sont régies par les règlements de l'Export Administration et du Département d'Etat des Etats-Unis. Si elles ont été/seront exportées, elles doivent se conformer à ces règlements. Toute modification du contrat de transport contraire aux lois des Etats-Unis est interdite.</p> <p>These commodities/technologies are subject to US Export Administration & US State Dept. Regulations and, if intended for export, ware/house exported thereunder. Diversion contrary to US Law is Prohibited.</p> <p>Nous certifions par la présente, que le matériel couvert par cette certification est conforme aux spécifications admises/entendues et aux exigences applicables pour le matériel, y compris toute spécification faisant partie de la description. Les rapports d'essai sont archivés pour fins de consultation. Toute requête concernant du matériel défectueux sera réglée à moins qu'elle ne soit faite par écrit à A.M. Castle & Co. dans les 90 jours suivant la livraison. Le matériel coupé sur mesure ou occupé par le client ne peut être retourné pour crédit.</p> <p>We hereby certify the material covered by this certification conforms in accordance with the above specifications and has been found to meet the applicable requirements for the material, including any specifications forming a part of the description. Test reports are on file subject to examination. All claims for defective material are waived unless made in writing to A.M. Castle & Co. within 90 days of the shipment. Material cut to the correct size, or material cut by the customer cannot be returned for credit.</p>		<p>Ce matériel a été reçu et inspecté par This material has been received and inspected by:</p>		<p>Date:</p>	
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02-06-'09 15:51 FROM-metalex castle

514-695-3281

T-223 P006/008 F-789

SP425.00-A

**Crucible
Specialty Metals**
A Division of Crucible Materials CorporationP.O. BOX 977
SYRACUSE
NEW YORK 13201**CERTIFICATE OF TEST**

S H I P O	A M CASTLE, INC	A M CASTLE, INC	OUR ORDER NO
	3400 N WOLF RD FRANKLIN PARK, IL 60131	3400 N WOLF RD FRANKLIN PARK, IL 60131	5-13796-8-0
			DATE
		07	09/12/08
CUSTOMER ORDER # & DATE		CUSTOMER REQ. #	DISTRICT
01-10130			B PARSONS
		SHIPPED FROM	SYRACUSE

DESCRIPTION OF MATERIAL

CRU 17-4PH RT A TAC 14970 SIZE 4.500 RD AIM+.031/.0
 AMC-3174-02 REV 28 ASME-SA564-07ED T330 ASTM-A564-04 T330
 AMS-2303E AMS-5643R (EX SURF) AISI-630 UNS-S17400
 DFANS 232.225-7014 ALT 1

5109p6103

HEAT NO.	CHEMICAL ANALYSIS										
A10357	C	MN	P	S	SI	NI	CR	MO	CU	CB	TA
	.050	.51	.022	.021	.54	4.24	15.25	.10	3.17	.29	.005

CASTLE METALS CORP
 DATE RCVD 9/15/08
 IAC 14970
 APPROVED BY [Signature]

QUANTITY	HEAT NO.	MECHANICAL PROPERTIES					
5084 # A10357		TENSILE P81	YLD. 2X P81	2ELONG4D.	RED/AREAX	HARDNESS	
						BHN 349	
		CAPABILITY PHYSICALS AFTER 900 DEG. F. - 1 HR. AIRCOOL:					
		201,350	174,820	14.4	52	BHN 401	

- MACRO TEST OK

MICRO TEST OK

FERRITE 3 %

MAGNAFLUX P/S = 0/0

ELECTRIC FURNACE ADD MELTED

REDUCTION RATIO: 14.8:1

MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 2 HOURS

AT TEMPERATURE -

AIRCOOLED.

CRUCIBLE MATERIALS CORP. VENDOR #18610.

MATERIAL INGOT CAST.

NAFTA - YES

MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT
 NO WELD REPAIR PERFORMED
 MATERIAL MELTED IN U.S.A.

THANK YOU FOR SELECTING A QUALITY PRODUCT

MANUFACTURED BY THE EMPLOYEES OF CRUCIBLE SPECIALTY METALS DC

SWORN TO AND SUBSCRIBED BEFORE ME THIS

DAY OF _____, 20

NOTARY PUBLIC

DANA A. PURANO - QUALITY ASSURANCE REPRESENTATIVE

THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED IN ACCORD
 WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE WITH IT
 SPECIFICATION REQUIREMENTS.

CRUCIBLE MATERIALS CORPORATION
 ACTING BY AND THROUGH ITS SPECIALTY METALS DIVISION

CERTIFIED BY:

[Signature]

QUALITY ASSURANCE REPRESENTATIVE